

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

|   |    |  |
|---|----|--|
| (51) International Patent Classification <sup>6</sup> :<br>E04C 2/38, E04F 13/08, E04B 2/90 | A1 | (11) International Publication Number: <b>WO 95/26450</b>      |
|   |    | (43) International Publication Date: 5 October 1995 (05.10.95) |

(21) International Application Number: PCT/AU95/00168

(22) International Filing Date: 24 March 1995 (24.03.95)

(30) Priority Data:  
PM 4781 29 March 1994 (29.03.94) AU

(71) Applicant (for all designated States except US): JAMES  
HARDIE & COY. PTY. LIMITED [AU/AU]; 1 Grand  
Avenue, Camellia, NSW 2142 (AU).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BADO, John [AU/AU];  
558 Smithfield Road, Greenfield Park, NSW 2176 (AU).  
ZARB, Joseph, Emmanuel [AU/AU]; 3 Gardiner Crescent,  
Fairfield West, NSW 2165 (AU).

(74) Agent: SHELSTON WATERS; 60 Margaret Street, Sydney,  
NSW 2000 (AU).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH,  
CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE,  
KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN,  
MW, MX, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI,  
SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent  
(AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA,  
GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW,  
SD, SZ, UG).

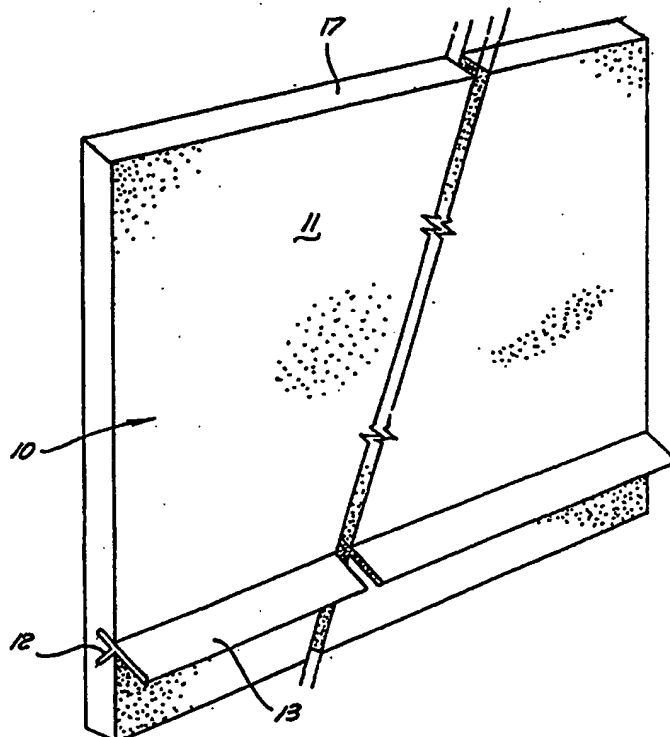
Published

With international search report.

(54) Title: CLADDING BOARD

(57) Abstract

A cladding board (10) for fixing in partial overlapping relationship with a like board (10). The board (10) includes a longitudinally extending first face (11) which, in use, partially overlaps with the opposing face of a like board (10) and a retaining formation (12) in the first face (11) adapted to captively retain an aligning spline (13) having a complementary retaining formation.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

|    |                          |    |                                       |    |                          |
|----|--------------------------|----|---------------------------------------|----|--------------------------|
| AT | Austria                  | GB | United Kingdom                        | MR | Mauritania               |
| AU | Australia                | GE | Georgia                               | MW | Malawi                   |
| BB | Barbados                 | GN | Guinea                                | NE | Niger                    |
| BE | Belgium                  | GR | Greece                                | NL | Netherlands              |
| BF | Burkina Faso             | HU | Hungary                               | NO | Norway                   |
| BG | Bulgaria                 | IE | Ireland                               | NZ | New Zealand              |
| BJ | Benin                    | IT | Italy                                 | PL | Poland                   |
| BR | Brazil                   | JP | Japan                                 | PT | Portugal                 |
| BY | Belarus                  | KE | Kenya                                 | RO | Romania                  |
| CA | Canada                   | KG | Kyrgyzstan                            | RU | Russian Federation       |
| CF | Central African Republic | KP | Democratic People's Republic of Korea | SD | Sudan                    |
| CG | Congo                    | KR | Republic of Korea                     | SE | Sweden                   |
| CH | Switzerland              | KZ | Kazakhstan                            | SI | Slovenia                 |
| CI | Côte d'Ivoire            | LI | Liechtenstein                         | SK | Slovakia                 |
| CM | Cameroon                 | LK | Sri Lanka                             | SN | Senegal                  |
| CN | China                    | LU | Luxembourg                            | TD | Chad                     |
| CS | Czechoslovakia           | LV | Latvia                                | TG | Togo                     |
| CZ | Czech Republic           | MC | Monaco                                | TJ | Tajikistan               |
| DE | Germany                  | MD | Republic of Moldova                   | TT | Trinidad and Tobago      |
| DK | Denmark                  | MG | Madagascar                            | UA | Ukraine                  |
| ES | Spain                    | ML | Mali                                  | US | United States of America |
| FI | Finland                  | MN | Mongolia                              | UZ | Uzbekistan               |
| FR | France                   |    |                                       | VN | Viet Nam                 |
| GA | Gabon                    |    |                                       |    |                          |

- 1 -

Title: "CLADDING BOARD"

#### FIELD OF THE INVENTION

The present invention relates to cladding boards and more particularly to cladding boards for  
5 fixing in partial overlapping relationship with one another.

#### BACKGROUND OF THE INVENTION

As well known in the art, buildings exterior walls are clad with boards to provide an exterior  
10 surface ready for painting and the like.

The boards are generally fastened to the wall studs that comprise the frame of a building with an even overlap up the wall. The top portion of a lower board is covered by the bottom portion of the  
15 next highest board, with all the boards in a parallel configuration. The boards must be as parallel as possible to provide uniform covering of the frame and to maintain a neat appearance.

- 2 -

Generally, fasteners pierce the top portion of the board and the overlapping by the bottom portion of the next highest board provides a neat appearance by concealing the fasteners.

5           In this method of construction the lower most board is positioned horizontally, usually with the aid of a spirit level or such device, to establish a datum. The other boards are then positioned to overlap one another, at equal intervals up the frame  
10 parallel to this datum, until the frame is concealed.

          This method of cladding would generally require at least two people to locate the boards in an even spacing parallel to one another. The boards being up to several meters in length are difficult to  
15 position, align and hold in position whilst fasteners are attached. This task becomes even more difficult and time consuming if only one person is attaching the boards to the building frame.

          In an attempt to overcome these problems some  
20 boards are provided with an aligning spline located near the lower edge of, and parallel to, the board's longest side. These aligning splines require only one board (the lower most) to be positioned horizontally. The aligning splines of successive  
25 higher boards locate against the top edge of the board below and as such they are held at a uniform spacing and in a parallel relationship. In this

- 3 -

situation only one person is required to insert the fastening means as the board rests under its own weight in the correct position.

However, boards of this type have the aligning spline factory installed and the height of the boards in relation to one another is fixed. Positioning boards at different heights, for example when approaching the top of the building frame, becomes very difficult. Also, when forming butt joints, on corners for example, the spline must be cut away to allow room for the joint, before the board can be positioned. A similar problem is encountered when attempting to use joint trimmers between two boards side by side. As the splines are rigidly attached to the boards they are difficult to trim.

Furthermore, the boards cannot be stacked easily due to the spline protruding from the board. Inventory levels are also required to be higher than normal since both splined and conventional boards may be required to be kept in stock.

#### DISCLOSURE OF THE INVENTION

It is an object of the present invention to overcome or ameliorate at least some of these deficiencies of the prior art.

According to the invention there is provided a cladding board for fixing in partial overlapping

- 4 -

relationship with a like board, said board includes:  
a longitudinally extending first face which, in use,  
partially overlaps with the opposing face of a like  
board; and, a retaining formation in the first face  
5 adapted to captively retain an aligning spline  
having a complementary retaining formation.

Preferably, the cladding board further  
comprises an aligning spline with a complementary  
retaining formation. The aligning spline is  
10 preferably releasably engageable with said board.

More specifically, the board is desirably  
constructed from fibre reinforced cement suitable  
for exterior cladding of building frames.

In one embodiment, the retaining formation  
15 extends longitudinally along the first face.

By way of example, the retaining formation may  
include two outwardly diverging surfaces extending  
into the board.

In an embodiment, the retaining formation is in  
20 the form of a pair of outwardly diverging recesses,  
each of the recesses including one of the surfaces  
therein.

In another embodiment, the aligning spline may  
take the form of an extrusion with an end profile of  
25 a flat rectangular member having a perpendicular  
extension, the extension and the corresponding end

- 5 -

of the rectangle being configured to mate with the recesses in the board.

In another embodiment, the aligning spline may have an end profile of a dovetail configured to mate  
5 with a dovetailed recess in the board.

The complementary retaining formation along the length of the spline may be continuous, or alternatively, intermittent.

A preferred embodiment of the invention will now be described, by way of example only, with  
10 reference to the accompanying drawings in which:

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of an embodiment of a cladding board according to the invention;

15 Figure 2 is an enlarged perspective cutaway view of the cladding board shown in Figure 1 with the aligning spline removed from the cladding board;

Figure 3 is an end elevation of several of the boards shown in Figure 1 attached, in overlapping  
20 relationship, to a building frame;

Figure 4 is a partial end view of a second embodiment of a self aligning board according to the invention shown, in use, abutting an adjacent board;

Figure 5 is a partial end view of a third  
25 embodiment of a cladding board according to the invention shown, in use, overlapping an adjacent board;

- 6 -

Figure 6 is a partial end view of a fourth embodiment of a cladding board according to the invention shown, in use, overlapping an adjacent board;

5           Figure 7 is a partial end view of a fifth embodiment of a cladding board according to the invention shown, in use, overlapping an adjacent board;

10           Figure 8 is a partial end view of a sixth embodiment of a cladding board according to the invention shown, in use, overlapping an adjacent board;

15           Figure 9 is an embodiment of an aligning spline for use with the first embodiment of the cladding board according to the invention;

            Figure 10 is an embodiment of an aligning spline for use with the sixth embodiment of the cladding board according to the invention;

20           Figure 11 is an embodiment of an aligning spline for use with the second embodiment of the cladding board according to the invention; and

            Figure 12 is an embodiment of an aligning spline for use with the fifth embodiment of the cladding board according to the invention.

25           MODES FOR CARRYING OUT THE INVENTION

            Referring to the drawings, a first embodiment of the invention provides a cladding board 10 for



- 7 -

fixing in partial overlapping relationship with a like board. The board 10 includes a longitudinally extending first face 11 and a retaining formation 12 adapted to captively retain an aligning spline 13  
5 having a complementary retaining formation.

The board is generally constructed from fibre reinforced cement or other materials suitable for cladding building exteriors.

Retaining formation 12 includes two outwardly  
10 diverging surfaces 14a and 14b extending into the board. The surfaces 14a, 14b are the outer edge of outwardly diverging recesses 14 formed by two intersecting saw cuts extending into first face 11 at 45° and 135° respectively. The saw cuts in  
15 combination form a V-shaped recess having it's apex coincident with the first face 11.

The aligning spline 13 has a retaining formation complementary the retaining formation 12.

To position the aligning spline 13 with board  
20 10, the aligning spline is introduced into the retaining formation 12 by longitudinally sliding the end of aligning spline 13 into the formation 12 as shown in Figure 1.

Trimming of the aligning spline 13 can be  
25 accomplished by sliding a portion, of the aligning spline 13 to be trimmed, out of the board 10 and cutting it with conventional means.

- 8 -

The board 10 is shown in Figure 3 attached to a building frame 15. In use, boards 10 are fixed to building frame 15 by fasteners 16 which may take the form of screws or nails or other such devices.

5 Aligning spline 13 then locates itself against the top face 17 of the next lowest self aligning board and holds the first face 11 in an overlapping relationship with the opposing face of the adjacent board. The fasteners 16 are inserted through the  
10 top portion at the board 10 into the building frame 15.

Generally, fasteners 16 are inserted through board 10 in such a position as to be concealed by the next highest overlapping board 10.

15 In this particular embodiment, aligning spline 13 is an extrusion which has an end profile of a flat rectangular member 18 having an extension 19.

Referring to Figures 4 to 8 there is as shown self aligning boards having alternative embodiments  
20 of the formation 12 and complementary aligning spline 13. In the embodiment shown in Figure 8 the retaining formation 12 is in the form of a dovetail. Surfaces 14a and 14b are provided on the internal edge of the complementary dovetailed recess.

25 In the first embodiment the edge 20 of the spline is trimmed parallel to, and flush with, the back face 21 of the board it overlaps. This ensures

- 9 -

the upper board seats snugly against the lower board. Alternatively, as shown in Figures 4 to 8 edge 20 can be made shorter than the length of the top face 17 of the board it overlaps.

5           Generally, the aligning spline has a constant profile along it's length.

          Figures 9 to 12, however, show different examples of the aligning spline 13. In these examples the angled extensions 23 and 24 of the  
10           spline that engage the board 10 are discontinuous but are still able to be captively retained by the complementary formation 12. The four discontinuous embodiments shown are particularly advantageous when forming the aligning spline from a flat piece of  
15           steel plate or similar at it can simply be pressed into the configuration shown. This method of construction can provide significant cost savings over extruded aligning splines.

          The aligning spline is generally inserted into  
20           the cladding board on-site and prior to application to a building frame. Accordingly this provides for a cladding board that is easier to transport and stack than conventional boards with a factory fitted spline. The aligning spline is also less prone to  
25           damage due to it being inserted into the cladding board on-site.

- 10 -

Although the invention has been described with reference to a specific example, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

- 11 -

## CLAIMS

1. A cladding board for fixing in partial overlapping relationship with a like board, said board includes: a longitudinally extending first  
5 face which, in use, partially overlaps with the opposing face of a like board; and, a retaining formation in the first face adapted to captively retain an aligning spline having a complementary retaining formation.
- 10 2. A cladding board as claimed in claim 1 including an aligning spline with a complementary retaining formation.
3. A cladding board as claimed in claim 2, wherein said aligning spline is releasably engageable with  
15 said board.
4. A cladding board as claimed in any one of claims 1 to 3, wherein the cladding board is fibre reinforced cement.
5. A self aligning board as claimed in any one of  
20 the preceding claims, wherein the retaining formation extends longitudinally along said first face.
6. A cladding board as claimed in any one of the preceding claims, wherein the retaining formation  
25 includes two outwardly diverging surfaces extending into said board.

- 12 -

7. A cladding board as claimed in claim 6, wherein the retaining formation includes a pair of outwardly diverging recesses, each said recess including one of said two surfaces therein.

5 8. A cladding board as claimed in claim 7, wherein said recesses in combination form a V-shaped recess, the apex of the V-shaped recess co-incident with the first face.

10 9. A cladding board as claimed in claim 7, wherein the two said recesses extend into the first face at approximately 45° and approximately 135° to the first face respectively.

15 10. A cladding board as claimed in any one of claims 7 to 9, or wherein the aligning spline has an end profile of a flat rectangular member having an extension, the extension and the corresponding end of the rectangle being configured to mate with the recesses in the board.

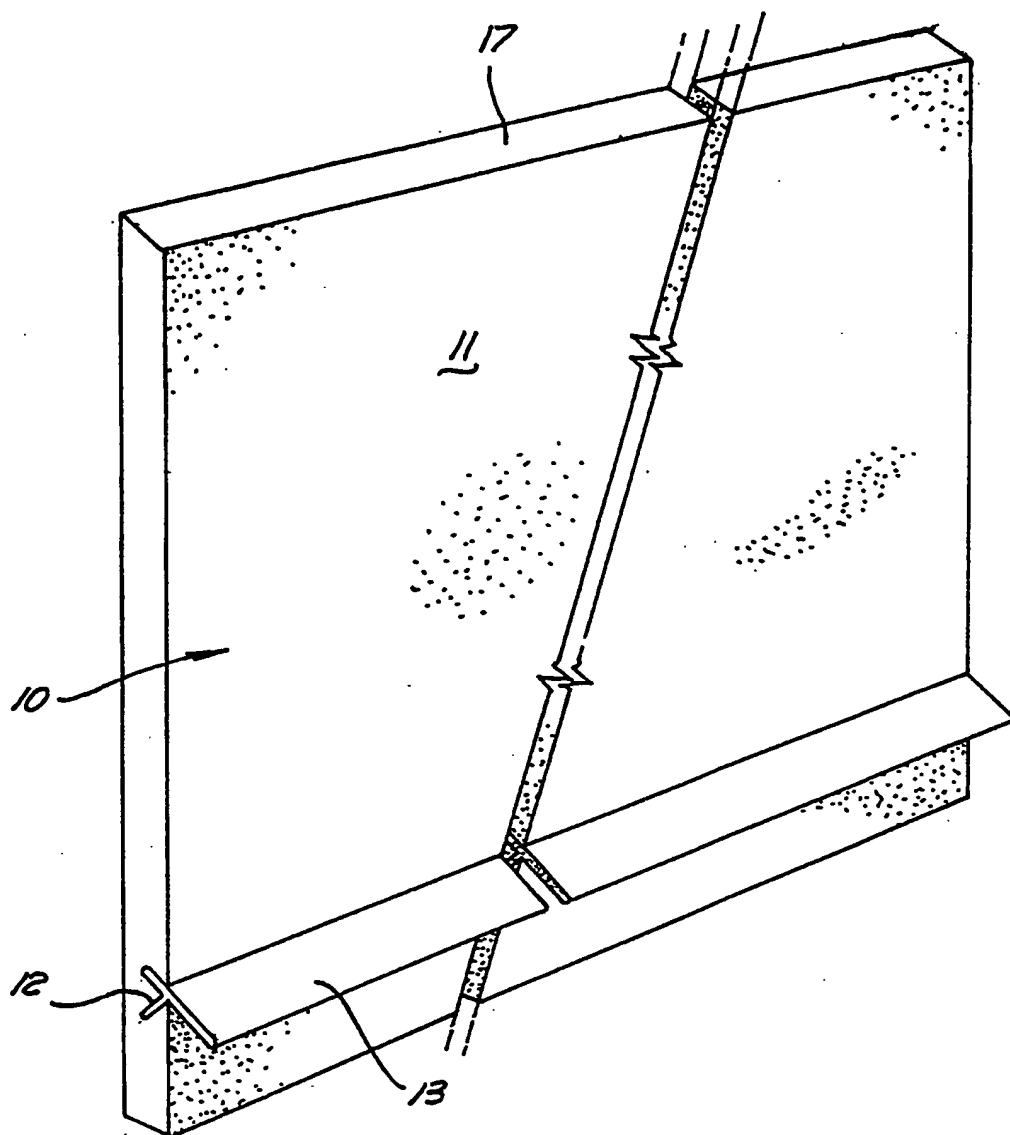
20 11. A cladding board as claimed in claim 6 wherein said retaining formation includes a dovetailed recess, each internal edge of the dovetailed recess including one of each said two surfaces.

25 12. A cladding board as claimed in claim 11, wherein the aligning spline has an end profile of a dovetail configured to mate with the dovetailed recess in the board.

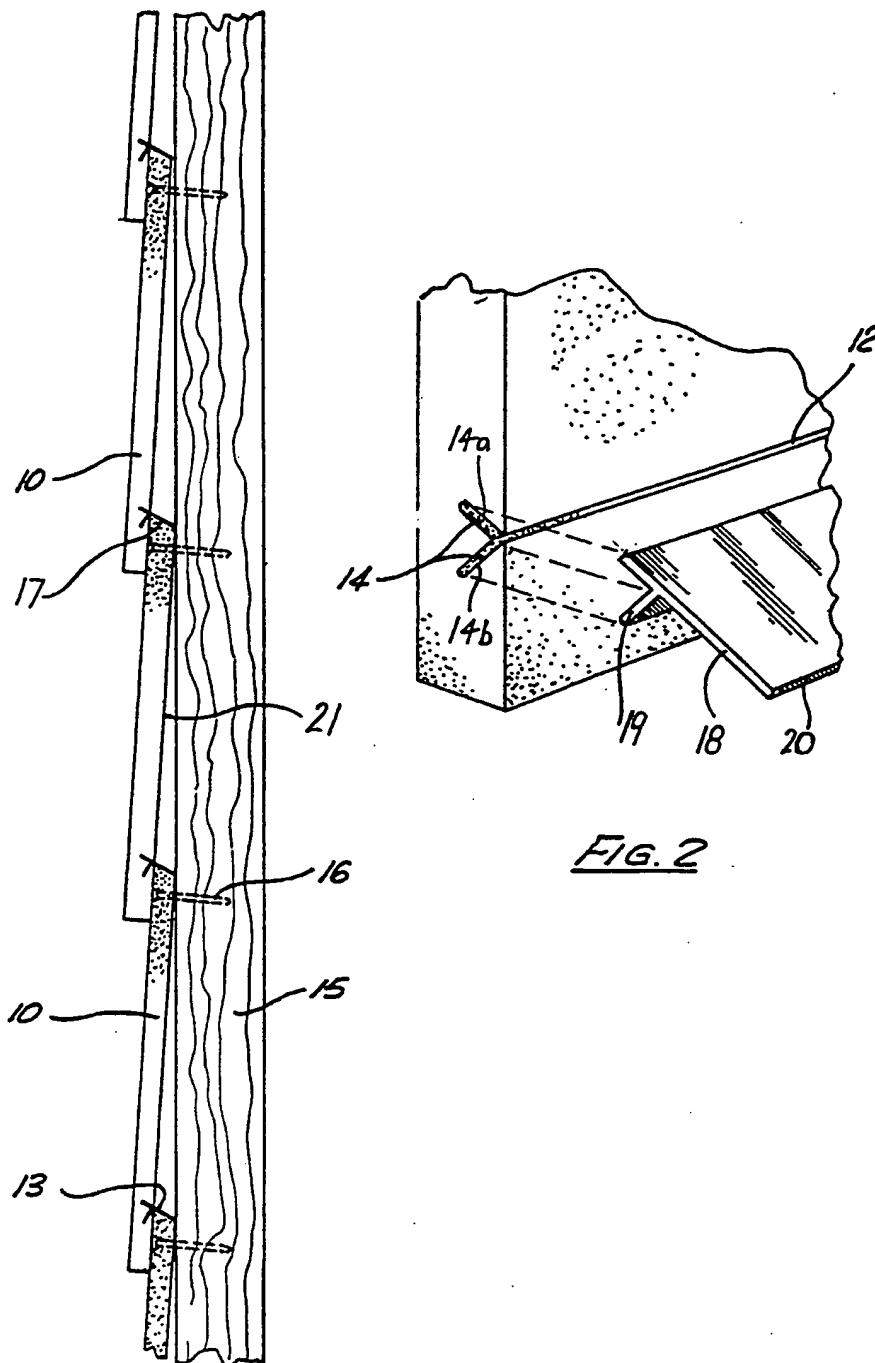
- 13 -

13. A cladding board as claimed in any one of claims 2 to 12, wherein the complementary retaining formation is continuous along the length of the aligning spline.
- 5 14. A cladding board as claimed in any one of claims 2 to 12, wherein the complementary retaining formation is intermittent along the length of the aligning spline.
- 10 15. A cladding board as claimed in any one of claims 2 to 14 wherein the aligning spline is adapted to slide longitudinally along the retaining formation.
16. A cladding board as hereinbefore described with reference to the accompanying drawings.

1/4







3/4

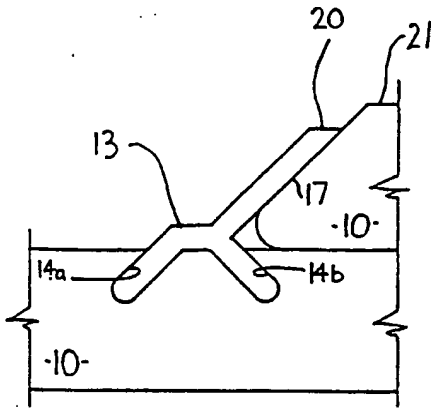


FIG. 4

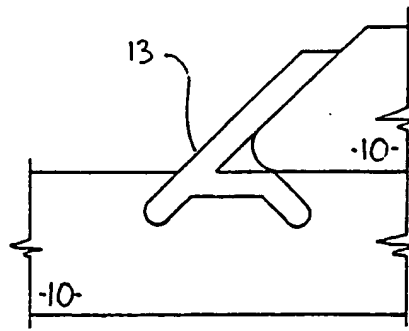


FIG. 7

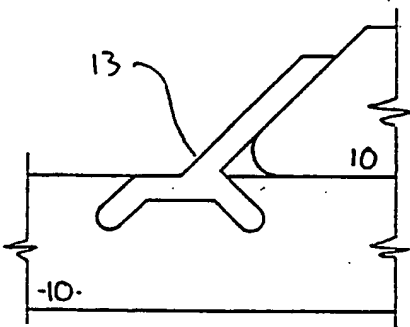


FIG. 5

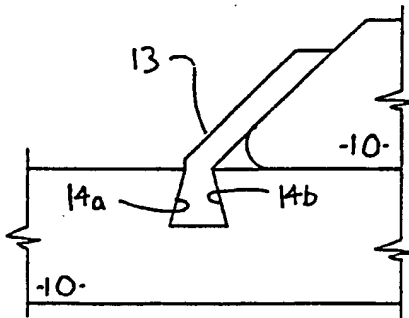


FIG. 8

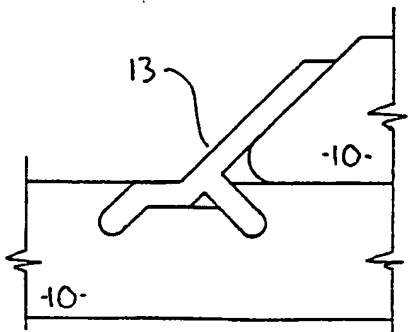
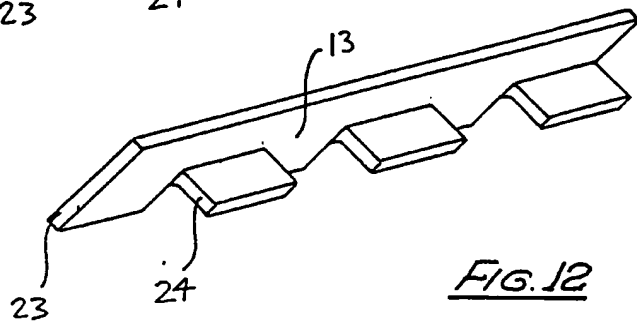
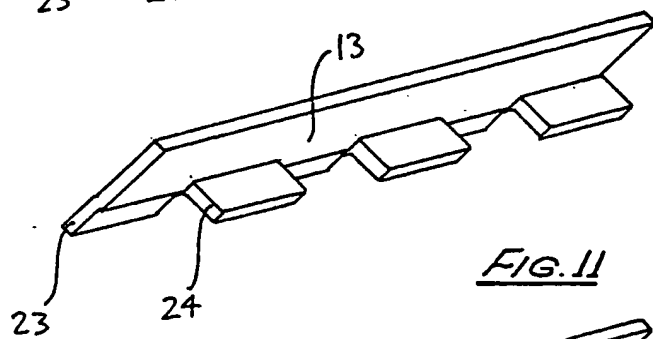
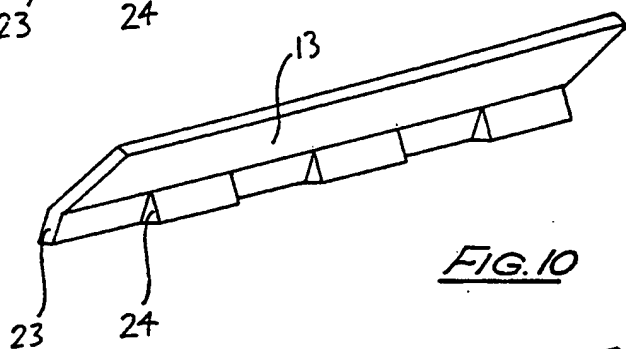
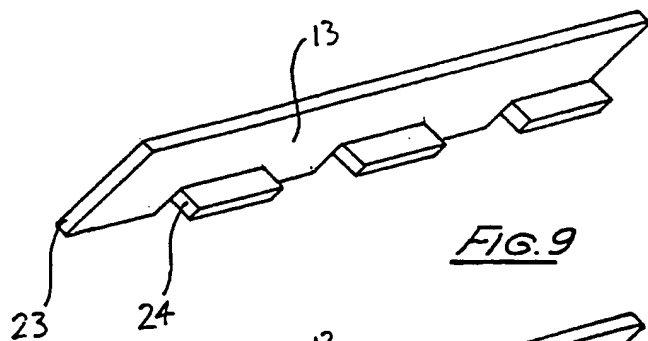


FIG. 6



## INTERNATIONAL SEARCH REPORT

|  |  |  |  |  |  |
|--|--|--|--|--|--|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br>Int. Cl. <sup>6</sup> E04C 2/38; E04F 13/08; E04B 2/90<br><br>According to International Patent Classification (IPC) or to both national classification and IPC  |  |  |  |  |  |
| <b>B. FIELDS SEARCHED</b><br><br>Minimum documentation searched (classification system followed by classification symbols)<br>E04B 2/-; E04C 2/-; E04F 13/08<br><br>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>AU IPC: E04B 2/56, 2,90, 2/96; E04C 2/38; E04F 13/08, 13/10<br><br>Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)<br>DERWENT: (SPLIN: OR RIB: OR RIDGE: OF PROTRUSION) AND (GROOV: OR SLOT: OR CHANNEL: OR FURROW:)   |  |  |  |  |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |  |  |  |  |  |
| <b>Category *</b>  | <b>Citation of document, with indication, where appropriate, of the relevant passages</b>  | <b>Relevant to Claim No.</b>   |  |  |  |
| A  | US 1399023 A (MURRAY) 6 December 1921  | 1-15   |  |  |  |
| A  | GB 558584 A (AIREY) 12 January 1944  | 1-15   |  |  |  |
| X  | AU 84015/82 B (559883) (WATSON ET AL)<br>Figures 3 and 7, page 3 lines 7 to 27, page 4 line 6 to page 5 line 5   | 1-4, 14  |  |  |  |
| <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.         </div> <div> <input checked="" type="checkbox"/> See patent family annex.         </div> </div>  |  |  |  |  |  |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <b>* Special categories of cited documents :</b><br/> <b>"A"</b> document defining the general state of the art which is not considered to be of particular relevance<br/> <b>"E"</b> earlier document but published on or after the international filing date<br/> <b>"L"</b> document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br/> <b>"O"</b> document referring to an oral disclosure, use, exhibition or other means<br/> <b>"P"</b> document published prior to the international filing date but later than the priority date claimed         </td> <td style="width: 33%; vertical-align: top;"> <b>"T"</b> later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention<br/> <b>"X"</b> document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br/> <b>"Y"</b> document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br/> <b>"&amp;"</b> document member of the same patent family         </td> <td style="width: 33%;"></td> </tr> </table> |  |  | <b>* Special categories of cited documents :</b><br><b>"A"</b> document defining the general state of the art which is not considered to be of particular relevance<br><b>"E"</b> earlier document but published on or after the international filing date<br><b>"L"</b> document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br><b>"O"</b> document referring to an oral disclosure, use, exhibition or other means<br><b>"P"</b> document published prior to the international filing date but later than the priority date claimed | <b>"T"</b> later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention<br><b>"X"</b> document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br><b>"Y"</b> document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br><b>"&amp;"</b> document member of the same patent family |  |
| <b>* Special categories of cited documents :</b><br><b>"A"</b> document defining the general state of the art which is not considered to be of particular relevance<br><b>"E"</b> earlier document but published on or after the international filing date<br><b>"L"</b> document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br><b>"O"</b> document referring to an oral disclosure, use, exhibition or other means<br><b>"P"</b> document published prior to the international filing date but later than the priority date claimed   | <b>"T"</b> later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle of theory underlying the invention<br><b>"X"</b> document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br><b>"Y"</b> document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br><b>"&amp;"</b> document member of the same patent family |  |  |  |  |
| Date of the actual completion of the international search<br>9 May 1995  |  | Date of mailing of the international search report<br>29 May 1995 (29.05.95) |  |  |  |
| Name and mailing address of the ISA/AU<br><br>AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION<br>PO BOX 200<br>WODEN ACT 2606<br>AUSTRALIA<br><br>Facsimile No. 06 2853929   |  | Authorized officer<br><br><b>D LUM</b><br><br>Telephone No. (06) 2832544     |  |  |  |

## INTERNATIONAL SEARCH REPORT

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |   |                       |
|--|---|-----------------------|
| Category*  | Citation of document, with indication, where appropriate of the relevant passages | Relevant to Claim No. |
| A  | CA 1084230 A (HAFNER)   | 1-15                  |
| A  | GB 2252987 A (IMPIZ PTY LTD)  | 1-15                  |
| P,A  | CH 684285 A (BOSTITCH AG) 15 August 1994  | 1-15                  |

Information on patent family member.

**PCT/AU 95/00168**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document<br>Cited in Search<br>Report             |            |    | Patent Family Member |     |           |
|--|------------|----|----------------------|-----|-----------|
| AU   | 82/84015 A |    |                      |     |           |
| CA   | 1084230 A  |    |                      |     |           |
| GB   | 2252987 A  | CA | 2044511 A            | DAU | 655921 B2 |
| CH   | 684285 A   |    |                      |     |           |
| <br><br><br><br><br><br><br><br><br><br><br><br><br><br> |            |    |                      |     |           |
| END OF ANNEX   |            |    |                      |     |           |